12. Blue & Engelmann Spruces-Subalpine Fir Riparian Ecological Series

	Table 12-1. Full and short names for the ecological types in the Spruce-Fir Riparian Ecological Series.										
Ecologica Code	al Type Name	Plant Association Code	Short Name								
FR3	Blue spruce-cottonwood/alder-silvertop sedge— Deep alluvial Endoaquolls, sandy subsurface—Flat to U-shaped terraces and floodplains, < 8,900 ft	PIPU-POAN3/ ALINT-CAFO3	Spruce-cottonwood–Sandy wet soils– Terraces								
FR4	Spruce/honeysuckle-reedgrass–Deep sandy Cryaquolls and Cryaquents–V- to U-shaped alluvial floodplains and draw bottoms, 2-14% slope, 8,900-10,500 ft	PIPU-PIEN/DIIN4- CACA4	Spruce/honeysuckle-reedgrass–Deep sandy moist soils–Narrow bottoms								
FR5	Spruce/red-osier–Cryaquolls and Cryaquents–V- shaped, narrow alluvial watercourses, 8,500-9,200 ft	PIPU-PIEN/SWSE	Spruce/red-osier–Moist soils–Bottoms								
FR6	Subalpine fir-Engelmann spruce/Arrowleaf groundsel-bluebells-bittercress–Moderately deep to deep Cryaquolls–V-shaped, narrow ravines and draw bottoms, >9,500 ft	ABBI2-PIEN/ SETR-MECI3-CACO6	Fir-spruce/wet forbs–Moist soils– Narrow V-shaped bottoms								

This riparian *Picea pungens-P. engelmannii-*Abies lasiocarpa series is described here for the first time. It is based on the *Picea pungens* series of Moir and Ludwig (1979, in part), Hess (1981-1986), Hess and Wasser (1982), Youngblood and Mauk (1985, in part), Alexander (1985-1988, in part), Fechner (1985, in part), Komárková (1986-1988, in part), DeVelice and others (1986, in part), B. Alexander and others (1987, in part), Larson and Moir (1989), Muldavin and others (1990, in part), Moir (1993, in part), and Kittel and others (1994). It is also based on the *Picea pungens* Alliance of Kittel and others (1996) and on the Abies lasiocarpa series, in part, of Pfister and others (1977), Hess (1981-1986), Steele and others (1981-1983), Mauk and Henderson (1984), Alexander (1985-1988), DeVelice and others (1986), Cooper and others (1987), Komárková and others (1988), and Kittel and others (1994), as well as on the Picea engelmannii Series, in part, of Mauk and Henderson (1984) and Larson and Moir (1989). Sites are usually long and narrow, and associated with a stream channel.

Vegetation, Climate, Soils

Tree productivity is moderate to high, and can be very high in level, unrocky spruce sites (Moir and Ludwig 1979, Hess and Alexander 1986, Komárková and others 1988, Hansen and others 1988-1989ab). Use of heavy equipment is damaging to these sites any time, but especially in early spring and late fall when the soils are wettest (DeVelice and others 1986, Hansen and others 1989ab). Wet soils are a major limitation on construction of roads and trails and on silvicultural activities. Compaction is not a problem, since sites are rocky and typically well armored.

Table 12-2. Climate, Soils and Water								
Characteristic	Value	Reference						
Streamflows	Average 9-11 m³/sec 410-500 cfs	Young 1994						
Soil pH	pH 7 ± 0.47							
Peat depth	123 ± 45 cm 48 ± 18 in	Johnson 1996						
Water temperature	8 ± 1.9°C 46 ± 3.4°F							
Water table depth	-3.8 ± 4.5 cm -1.5 ± 1.8 in							

Regeneration difficulties can be expected, since sites are cold and wet. Shrubs and regeneration are often browsed by big game and must compete with graminoids for resources (Larson and Moir 1989, Hansen and others 1989ab). Regeneration of subalpine fir is often sporadic and may require the raised microsites of hummocks and fallen logs (Steele and others 1983).

Spruce beetle is a fairly common insect pest in Engelmann spruce trees within these sites, more rarely in blue spruce (Schmidt and Hinds 1974, Schmidt and Frye 1977).

Timber Management

Engelmann spruce, blue spruce, and less often lodgepole pine are the species on these sites most commonly considered for timber management. However, silvicultural treatment (especially production management) of these riparian sites is not recommended because of the difficulty of aftersale management to avoid permanent watershed damage.

Light silvicultural treatment can be considered to relieve major forest health problems, where regeneration of wildlife habitat is needed, or where correction of visual problems is needed (Komárková and others 1988). Any timber harvesting must be rigidly controlled, because of the sensitivity of soils and landforms to disturbance (Mauk and Henderson 1984, Hess and Alexander 1986).

In most cases, partial cutting leaves the remaining large trees prone to windthrow (Mauk and Henderson 1984, Hess and Alexander 1986, Cooper and others 1987, Fitzhugh and others 1987). Overstory removal tends to raise the water table. This further threatens conifer seedlings and site recovery as sedges and reedgrass compete with tree seedlings (Steele and others 1983, Mauk and Henderson 1984, Hess and Alexander 1986, Cooper and others 1987, Komárková and others 1988).

Skidding logs can compact the soil and accelerate erosion (DeVelice and others 1986). Openings created by timber activities sometimes fill with dense sedge mats that prevent conifer seedling establishment (DeVelice and others 1986). Logging or burning may renew browse production in cases where the browse has been depleted by big game (Hansen and others 1989ab), but burned stands may also experience an elevated water table (Kovalchik 1987).

Fire Management

Stands have a low susceptibility to fire (Hansen and others 1988). Hot crown fires occur over long intervals, perhaps 200-300 years (DeVelice and others 1986, Kovalchik 1987, Hansen and others 1989ab). Crown fires eliminate the canopy, and lead to dramatic increases in bluejoint reedgrass (CACA4) in resulting openings where it is present (Hansen and others 1988). Coarse-woody debris is more likely to be transported in streams following fires because of increased flows and decreased bank stability (Young 1994). Stands series are classified in Fire Group 16 – the very moist spruce and subalpine fir habitat types (Crane 1982).

Range and Wildlife Management

Livestock forage production is moderate to very low at most seral stages (Hansen and others 1988), but usually little forage is available to livestock (Youngblood and others 1985) because sites are difficult to access (Girard and others 1995). Livestock visit sites frequently for water and shade, especially those stands adjacent to nonforested rangelands (Steele and others 1983). Use by livestock damages wet soils and accelerates erosion (Steele and others 1983, Youngblood and others 1985, DeVelice and others 1986). Where these

riparian areas are adjacent to upland rangelands, some protection of the stream and its banks or livestock control barriers may be required unless the stream banks are well armored by rock. Heavy big game and livestock use reduces or removes shrub layers in some stands. This results in the reported "*Picea pungens/Poa* spp." type (Moir and Ludwig 1979, Hoffman and Alexander 1983), which is clearly seral to a riparian forest with more shrubs

Wildlife values are high to very high, probably highest in community types with significant shrub layers (Youngblood and others 1985) which provide browse, cover, and water for big game and habitat for many birds and furbearers. Black bear and elk make seasonal use of these sites (Youngblood and Mauk 1985), and deer may spend much time here (Kovalchik 1987). Moose sometimes browse subalpine fir closely in this type in Montana (Hansen and others 1989ab). Elk and black bear (and grizzly bear and moose in Wyoming and Idaho) use these sites for wallows and food (Steele and others 1983, Youngblood and others 1985, Hansen and others 1989ab). Seral stages may produce willows and sedges that are sought by elk and moose in Wyoming and Idaho (Steele and others 1983). Great blue herons may nest here if the sites are isolated (Hansen and others 1989ab). Clearcutting small (3-acre) blocks is mildly beneficial to big game, and neutral or slightly negative for animals requiring or favoring closedcanopy or old-growth forests, such as cavity nesters and snowshoe hare (Crouch 1985).

Recreation, Roads & Trails, Scenery

Protection of the watershed, streams, and hydrology of these sites should be the paramount management concern (Youngblood and Mauk 1985, Hansen and others 1989ab). Sites are fairly easy to revegetate, since they are well watered and have deep soils, though weeds are a limitation, as is choosing plants that are adapted to periodic flooding and high water tables. Sites are unsuitable for recreation development. Sites are often too rocky and wet for dispersed camping (Steele and others 1983), so most recreation use is access for fishing and hiking trails (Steele and others 1983), which have little effect.

Stands are poorly suited for roads and trails, because they are difficult to build and maintain in such sites, and very expensive. Roads and trails should be routed elsewhere (Hansen and others 1988-1989ab, also see Cooper and others 1987).

These sites have high scenic value, especially for wildlife viewing and hunting, and where cottonwood is present, viewing fall colors.



Looking into a mixed blue spruce-cottonwood riparian area (Community Type B); the photo is roughly parallel to the channel and about 10 m (30 ft) left of it. Silvertop sedge 59% cover, cottonwood 54%, swamp bluegrass 19%, Baltic rush 14%, blue spruce 6%. Coarse Fragments Cover = 0%, Total Live Cover = 229%, Coarse Fragments in Soil = 7. Soil sampled as a Typic Endoaquoll, Sandy.

Mineral Mountain Quadrangle, elevation 8,825 ft, 4% NNW-facing slope. July 27, 1990.

Key to Ecological Types in the Spruce-Fir Riparian Series

1. Narrowleaf cottonwood (POAN3) present and reproducing, usually >10% cover. Elevations <9,000 ftFR3 1. Narrowleaf cottonwood absent or <1% cover. Elevations >8,500 ft(2)
2. Red-osier dogwood (swse) absent
3. Subalpine fir (ABBI2) conspicuous, >5% cover, often >25% cover
4. Bush honeysuckle (DIIN5) usually absent, in any case <5% cover
5. Thinleaf alder (ALINT) conspicuous FR6 5. Thinleaf alder absent FR4
6. Trees and shrubs absent or occasional, always <1% cover. Site dominated by bluejoint reedgrass (CACA4) and wet forbs such as arrowleaf groundsel (SETR), bittercress (CACO6), or mountain bluebells (MECI3)FR6 6. At least one tree or shrub species conspicuous and >30% cover. Bluejoint reedgrass and wet forbs often present and conspicuous as wellFR4

Table 12-3. Characteristics of Ecological Types within Ecological Series 12 in the Upper Gunnison Basin. Numbers are shown in form Average (Minimum-Maximum)										
Code Short Name	No. Samples	Elevation, ft	Avg. Aspect, °M (r) Slope, %	Soil Coarse, %	Depth, cm Mollic, cm	Surface: Coarse, % Bare, %	Cover, %: Trees Shrubs Graminoids Forbs	Total Live Cover, % No. Species TLC/NS, %		
FR3 Spruce-cottonwood–Sandy wet soils–Terraces	8	8,212 (7,810-8,825)	203 (0.69) 4 (2-6)	15 (0-30)	79 (74-80) 36 (8-80)	9 (0-48) 4 (0-10)	81 (62-101) 49 (11-139) 75 (9-182) 41 (10-83)	250.7 (139.6-332.6) 31 (23-41) 8.4 (4.5-13.8)		
FR4 Spruce/honeysuckle- reedgrass–Deep sandy moist soils–Narrow bottoms	15	9,696 (8,960-10,475)	165 (0.31) 7 (2-14)	29 (0-45)	66 (50-82) 36 (0-70)	5 (0-48)	81 (10-200) 66 (1-146) 105 (5-235) 108 (7-265)	371.8 (197.2-635.5) 24 (12-48) 18.6 (4.1-33.4)		
FR5 Spruce/red-osierMoist soilsBottoms	6	8,812 (8,560-9,180)	194 (0.73) 12 (3-36)	52	50 6	24 (2-95) 11 (2-25)	41 (0-109) 93 (35-153) 21 (3-63) 11 (4-23)	181.4 (76.4-279.5) 23 (17-26) 7.9 (3.5-10.7)		
FR6 Fir-spruce/wet forbs-Moist soils-Narrow V-shaped bottoms	12	10,254 (9,590-11,640)	127 (0.16) 11 (2-27)	43 (29-59)	50 (20-76) 26 (0-65)	4 (1-10) 4 (1-8)	65 (0-142) 25 (0-92) 42 (0-130) 93 (23-150)	231.3 (113.2-415.5) 23 (7-37) 12.6 (5.3-34.7)		

^{*.} Not sampled.

Blue spruce-cottonwood/alder-silvertop sedge— Deep alluvial Endoaquolls, sandy subsurface— Flat to U-shaped terraces and floodplains, < 8,900 ft

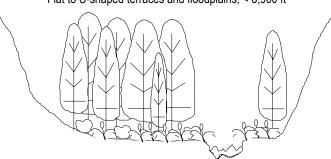


Figure 12-1. Cross-section of vegetation structure of *Spruce-cottonwood–Sandy wet soils–Terraces*. Gradients average 3.6%.

Spruce-cottonwood–Sandy wet soils–Terraces is a very common type along rivers and streams with relatively high gradients (compared with adjacent willow stands) in the upper Montane belt, on sandy soils, usually outside the deep rainshadows. This type has also been described from southern Colorado and northern New Mexico, and is probably also present in much of western Colorado and northeastern Utah.

Spruce-cottonwood—Sandy wet soils—Terraces is characterized by blue spruce (PIPU) codominant with narrowleaf cottonwood (POAN3), thinleaf alder (ALINT), and silvertop sedge (CAFO3). See Table 12-7 for common species names and codes. Location on broad terraces and bottoms is also a distinguishing feature.

Spruce-cottonwood–Sandy wet soils–Terraces is typically a narrow strip of forest 5-10 meters wide on either side of large, rocky rivers with enough rocks and gradient to cause 10-30% whitewater. The stand is a tall, nearly closed canopy of mixed blue spruce and cottonwood. Based on shade-tolerance principles, spruce would be expected to eventually dominate cottonwood, but we found only one stand where this was the case. The codominance seems to be permanent. There is usually some alder on the stream bank, and a few medium and short shrubs are scattered through the stand. The understory is patchy, with moderately dense graminoids such as Kentucky bluegrass and Baltic rush under the cottonwoods. The understory is sparser under the spruces, often including silvertop sedge only.

Spruce-cottonwood-Sandy wet soils-Terraces is related to Cottonwood/willow-Water-layered soils-Floodplains and Aspen-cottonwood-Deep alluvial soils-Floodplains, which occur consistently on floodplains on more open, slightly warmer sites with deeper soils, and which both lack natural blue spruce. Spruce-cottonwood-Sandy

wet soils—Terraces is also related to Spruce/honeysuckle-reedgrass—Deep sandy moist soils—Narrow bottoms, which occurs at higher elevations, sometimes in narrow draw bottoms. Spruce-cottonwood—Sandy wet soils—Terraces is also related to Spruce/red-osier—Moist soils—Bottoms, which also occurs at somewhat higher elevations in narrow, V-shaped bottoms, and includes red-osier dogwood (SWSE).

The plant association *Picea pungens-Populus angustifolia/Alnus incana* ssp. *tenuifolia-Carex foenea* is described as new here, based in part on *Populus angustifolia/Alnus incana* ssp. *tenuifolia-Swida sericea* (Johnston 1987 and Komarkova 1986), and based in part on *Picea pungens/Alnus incana* ssp. *tenuifolia* (De Velice 1985).

Moderately-heavy to heavy grazing by cattle, sheep, deer, or elk tends to decrease palatable shrubs such as serviceberry and some graminoids such as bluegrasses.

Sagebrush communities occur on adjacent dry, southerly slopes. Douglas-fir or aspen forests are found on adjacent protected, northerly slopes. Serviceberry communities border this type on sites protected from wind, where snow accumulates.

Horizontal obstruction has not yet been measured in this Ecological Type, though it is probably moderate to moderately low. There is little horizontal cover, browse, or forage in these stands. Their value to deer or elk is mostly for water and some thermal cover. Some of these sites may be lightly used during mild winters. In general, the sites are outside deer and elk winter range. Mule deer make moderate use of all of these communities in mild winters and moderately low use in spring through fall, but very low use in severe winters. Elk make low use of these sites at all seasons. The sites are marginal sage grouse range because they are not open enough, have steep margins and lack sagebrush.

Summary of Ecological Type Characteristics
1. Explanation of symbols in Appendix A. Percentages in [brackets] indicate the percentage of plots sampled that have that characteristic.

NUMBER OF SAMPLES	8, soil descriptions from 4 of these (total 8)
ELEVATION	8,212 ft (7,810-8,825 ft); 2,503 m (2,380-2,690 m)
AVERAGE ASPECT	203°M (r = 0.69)
LITHOLOGY	All igneous, granite-gneiss-breccia-tuff [67%] or schist-rhyolite [17%]
FORMATIONS ¹	Xg-Xfh-Xb [42%], Tpl-Taf-Tiql [42%]
LANDFORMS	Terraces and floodplains [88%]
SLOPE POSITIONS	Bottoms
SLOPE SHAPES	Flat or U-shaped [75%]
SLOPE ANGLE	3.6% (2-6%)
SOIL PARENT MATERIAL	Alluvium [89%]
COARSE FRAGMENTS	3.7% (0-14%) cover on surface, 14.7% (0-30%) by volume in soil
SOIL DEPTH	79 cm (74-80 cm); 31.1 in (29-31 in)
MOLLIC THICKNESS	36 cm (8-80 cm); 14.0 in (3-31 in)
TEXTURE	Loam, sandy loam, or silty loam on surface, Loamy sand, sandy loam, sand, or silty loam
	subsurface
SOIL CLASSIFICATION	All deep Endoaquolls
Total Live Cover	250.7% (139.6-332.6%)
Number of Species	30.5 (23-41)
Total Live Cover/No. Species	8.4% (4.5-13.8%)
CLIMATE	Cool, moist to wet.
WATER	These soils are sandy, rocky, and very permeable, and the stream gradients are high enough
	such that most of the water is in the stream, and never ponds.

Table 12-4. Wildlife values (relative to the whole UGB) for the principal wildlife species using Spruce-cottonwood–Sandy wet soils–Terraces.							
Mule Deer Elk							
CT	Season-Preference	Season-Preference					
	Winter, Mild- Moderate (Water, Browse)	Winter, Mild- Low					
All	Winter, Severe– Very Low	Winter, Severe– Very Low					
	Spring/Fall– Mod. Low (Water, Browse)	Spring/Fall– Low					

Community Type Descriptions

- A Blue spruce-cottonwood-alder-silvertop sedge-Kentucky bluegrass is codominated by blue spruce and cottonwood. Bluejoint reedgrass is >15% cover, and silvertop sedge is >5% cover. Alder is always present, although sometimes only a Trace. Swamp bluegrass is absent, but Kentucky bluegrass is prominent, >10% cover. Baltic rush is absent or <5% cover.
- **B** Cottonwood-blue spruce-Kentucky bluegrass-Baltic rush Bluejoint reedgrass is absent. Swamp bluegrass is prominent with >15% cover, and Kentucky bluegrass is prominent also. Baltic rush is conspicuous at >15% cover.
- C Blue spruce-cottonwood-rose-sparse swamp bluegrass Kentucky bluegrass is absent or <1%. Swamp bluegrass is always present, but in small quantities, <10% cover. Baltic rush is absent.

		Table 12-5. Con	nmunity types w	ithin Spruce-	cotto	nwood-Sand	y wet	soils-Terraces	S.	
Community Type	No. samples	Elevation, ft Slope, %	Coarseness, % Depth, cm Mollic Depth, cm	Surface Coarse, % Bare, % Seral Stage	Lr	Layer Height, m	Avg Layr Cvr %	Cover, %: Trees Shrubs Graminoids Forbs	No. Species Total Live Cover, % TLC/NS, %	Obstruction %: 1.5-2.0 m 1.0-1.5 m 0.5-1.0 m 0.0-0.5 m Total<2m
A. Blue spruce- cottonwood-alder- silvertop sedge- Kentucky bluegrass	3	8,393 (8,210-8,760) 2.9 (3-3)	23 (15-30) 80 (80-80) 13 (13-13)	1 6 (1-10) LS-LM	T1 T2 S1 T3 S2 GF M L	58 (43-84) 24 (10-30) 3.5 (1.6-6.5) 1.3 (0.3-4) 0.6 (0.1-1.3) 0.4 (0.0-1.1) Missing Missing	24.5 46.5 21.0 16.0 18.5 91.0 M		34 (27-41) 304 (250-333) 9.0 (8.1-9.7)	*
B. Cottonwood-blue spruce-Kentucky bluegrass-Baltic rush	2	8,453 (8,080-8,825) 5.0 (4-6)	13 80 20	* * LM	T1 T2 S1 T3 S2 GF M L	Missing 19 (8-22) Missing Missing 0.6 (0.1-1.0) 0.5 (0.1-0.9) Missing Missing	M 55 M M 11 95 M	74 (62-85) 18 (12-24) 143 (104-182) 39 (28-50)	28 (23-33) 273 (229-318) 10.4 (6.9-13.8)	*
C. Blue spruce- cottonwood-rose- sparse swamp bluegrass	3	7,870 (7,810-7,990) 3.3 (2-5)	10 (0-20) 78 (74-80) 56 (8-80)	13 2 (0-3) MS	T1 T2 S1 T3 S2 GF M L	22 (10-25) 4.8 (0.9-7.0) * 1.7 (0.4-3.5) 1.3 (0.1-1.8) 0.0 0.0	40.6 34.7 31.8 0.5 11.3 28.7 6.8 5.1	60 (11-139)	29 (25-31) 182 (140-264) 6.3 (4.5-8.8)	*

^{*.} Unknown: measurements were not taken in this CT.

Table 12-6. Resource Values for *Spruce-cottonwood–Sandy wet soils–Terraces*. Resource values were calculated from the numbers in Table 12-5, relative to the whole UGB.

The numbers in this table can be translated: 0 = Very Low, 1 = Low, 2 = Moderately Low, 3 = Moderate, 4 = Moderately High, 5 = High, and 6 = Very High.

		Community Ty	ре
Resource Value	Α	В	С
Potential Cattle Forage Production	2-3	3-4	1-2
Grazing Suitability	1	2	1
Wetland	No	No	No
Riparian Area	Yes	Yes	Yes
Potential Timber Production	4-5 – PIPU ¹	2-3 – PIPU ¹	4-5 – PIPU ¹
Timber Suitability	ns²	ns²	ns²
Developed Recreation	1	1	1
Dispersed Recreation	2	2	2
Scenic	4-5	4-5	4-5
Road & Trail Stability	2-3	2-3	2-3
Construction Suitability	1	1	1
Deer & Elk Hiding Cover	2-3	2-3	2
Deer & Elk Forage & Browse	2-3	1-2	1-2
Need for Watershed Protection	4-5	4-5	4-5
Soil Stability	2-3	2-3	2-3
Risk of Soil Loss-Natural	3-4	3-4	3-4
Risk of Soil Loss-Management	4	4	4-5
Risk of Permanent Depletion-Range	1-2	1	1
Risk of Permanent Depletion-Wildlife	1-2	1-2	1-2
Risk of Permanent Depletion-Timber	5	5	5
Resource Cost of Management	5	5	5
Cost of Rehabilitation	1-2	1-2	2

^{1.} Timber harvest not recommended. 2. Not suitable because riparian areas.



The Taylor River 4-5 mi above Almont. This is a typical expression of the blue spruce-cottonwood type in Community Type A. Gradients are typically > 2%, and there are a lot of stones and boulders in the banks and channel. There is a transect along the right bank (see photo on next page), Almont Quadrangle, elevation 8,210 ft, 2.8% SW-facing slope. September 5, 1990.



A view in a blue spruce-cottonwood stand on the banks of the Gunnison River north of Gunnison (Community Type C), just above the elevation where we begin to see (native) blue spruce mixed in cottonwood stands. Cottonwood 63% cover, blue spruce 4%, star Solomon-plume 23%, bluejoint reedgrass 17%. Soil sampled as a Typic Fluvaquent, Coarse-Loamy. Almont quadrangle, elevation 7,990 ft, 5% SSE-facing slope.

August 13, 1990.



Looking up a transect on the banks of the Taylor River (Community Type A), on the right bank in the photo on the previous page. Blue spruce 62% cover, bluejoint reedgrass 45%, coyote willow 37%, silvertop sedge 22%, rose 18%, alder 15%, horsetail 13%. Coarse Fragments Cover = 0% (the transect is oriented so that it doesn't cross the bank), Total Live Cover = 330%, Coarse Fragments in Soil = 15. Soil sampled as a Typic Fluvaquent, Fine-Loamy. Almont Quadrangle, elevation 8,210 ft, 2.8% SW-facing slope. September 5, 1990.

Table 12-7. Common Species in Spruce-cottonwood–Sandy wet soils–Terraces, where Characteristic cover > 10% or Constancy > 20%. "—" means that the species is not found. Dead cover is not listed. Ccv = Characteristic Cover, Con = Constancy. If Avc = Average Cover, then these are related using the formula Avc = Ccv•100%/Con.

	are related using the formula Avc = Ccv•100%/Con.									
	Community Type	Α	В (2)	C						
Cada	Cassian	Ccv (Con) N = 3	Ccv (Con)	Ccv (Con)	Common Nama					
Code	Species	N = 3		აა	Common Name					
111000	TREES		F (FO)	4 (00)						
JUSC2	Juniperus scopulorum		5 (50)	1 (33)	Rocky Mountain juniper					
PIPU POAN3	Picea pungens	44 (100)	23 (100)	48 (100)	blue spruce narrowleaf cottonwood					
POANS POTR5	Populus angustifolia Populus tremuloides	27 (100)	42 (100) 3 (50)	40 (100) T (33)						
PSME	Pseudotsuga menziesii	8 (100)	10 (50)	- (33)	quaking aspen Douglas-fir					
1 OIVIL	SHRUBS	0 (100)	10 (30)		Douglas-III					
ALINT	Alnus incana ssp. tenuifolia	14 (100)	T (50)	11 (67)	thinloof alder					
AMAL2	Amelanchier alnifolia	14 (100) T (33)	T (50)	T (67)	thinleaf alder Saskatoon serviceberry					
ARUV	Arctostaphylos uva-ursi			29 (33)	kinnikinnick					
ARTR2	Artemisia tridentata		15 (50)		big sagebrush					
DIIN5	Distegia involucrata	3 (100)		1 (67)	bush honeysuckle					
PAVI11	Padus virginiana	T (67)		7 (67)	common chokecherry					
RICE	Ribes cereum	T (33)	1 (50)		wax currant					
RIIN2	Ribes inerme	2 (100)	- ` -	T (67)	whitestem currant					
ROWO	Rosa woodsii	12 (100)	6 (100)	10 (Ì00)	Woods rose					
SALIX	Salix			10 (33)	willow					
SABE2	Salix bebbiana	10 (67)			Bebb willow					
SADR	Salix drummondiana	4 (67)	T (50)		blue willow					
SAEX	Salix exigua	37 (33)		2 (33)	sandbar willow					
SALUL	Salix lucida ssp. lasiandra	1 (67)			Pacific willow					
SWSE	Swida sericea	5 (100)		65 (33)	red-osier					
	GRAMINOIDS									
BRPO5	Bromopsis porteri	1 (33)	1 (50)		nodding brome					
CACA4	Calamagrostis canadensis	40 (100)		17 (33)	bluejoint reedgrass					
CAFO3	Carex foenea	24 (100)	59 (50)	1 (67)	silvertop sedge					
CARO5	Carex rossii			9 (67)	Ross sedge					
CAUT	Carex utriculata	6 (67)			beaked sedge					
ELRE3	Elytrigia repens	2 (67)			creeping quackgrass					
JUARA4	Juncus arcticus ssp. ater	1 (67)	37 (100)		Baltic rush					
LECI4 POPA2	Leymus cinereus		10 (50) 24 (100)	2 (100)	giant wildrye					
POPR	Poa palustris Poa pratensis	19 (100)	42 (100)	2 (100) T (33)	swamp bluegrass Kentucky bluegrass					
10110	FORBS	13 (100)	42 (100)	1 (33)	Nemucky bluegrass					
ACL AE		4 (400)	C (400)	0 (22)						
ACLA5	Achillea lanulosa	4 (100)	6 (100)	2 (33)	western yarrow					
ANSE4 ANAM	Androsace septentrionalis Angelica ampla	6 (67)		1 (67)	northern rock-jasmine giant angelica					
ERIGE2	Erigeron	0 (07)	5 (50)	1 (33)	fleabane					
ERFL	Erigeron flagellaris		5 (50) 	7 (67)	trailing fleabane					
FRVI	Fragaria virginiana	2 (67)		4 (33)	Virginia strawberry					
GASE6	Galium septentrionale	1 (67)	T (50)	T (33)	northern bedstraw					
GERI	Geranium richardsonii	7 (100)	9 (50)	1 (33)	Richardson geranium					
HESP6	Heracleum sphondylium	10 (33)		3 (33)	cow-parsnip					
MAST4	Maianthemum stellatum	21 (67)	6 (50)	23 (33)	star Solomon-plume					
ORPA3	Oreochrysum parryi	13 (67)	- ` -	- ` -	Parry goldenweed					
OXFE	Oxypolis fendleri	T (67)			Fendler cowbane					
RUAM9	Rudbeckia ampla	13 (33)			golden glow					
SICA3	Sidalcea candida		10 (50)		white checker mallow					
SPRO	Spiranthes romanzoffiana	1 (67)			continental lady's tresses					
TAOF	Taraxacum officinale	14 (67)	3 (100)	9 (33)	common dandelion					
VIAM	Vicia americana	3 (100)	1 (50)	T (33)	American vetch					
	FERNS & FERN-ALLIES									
EQAR	Equisetum arvense	19 (67)		3 (33)	field horsetail					
	GROUND COVER									
.BARESO	bare soil	6 (67)		2 (67)						
.LITTER	litter and duff	94 (100)	97 (50)	90 (100)						
GRAVEL	gravel 0.2-10 cm	1 ` ´	- ' '	4 ` ′						
.COBBLE	cobble 10-25 cm			8 (33)						
.STONES	stone > 25 cm			. -						
.MOSSON	moss on soil			10 (67)						
LICHENS	lichens on soil	-	-	8						

FR4 PIPU-PIEN/DIIN4-CACA4

SPRUCE/HONEYSUCKLE-REEDGRASS—DEEP SANDY MOIST SOILS—NARROW BOTTOMS

Spruce/honeysuckle-reedgrass—Deep sandy Cryaquolls and Cryaquents— V- to U-shaped alluvial floodplains and draw bottoms, 2-14% slope, 8,900-10,200 ft

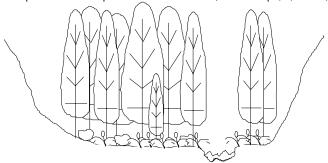


Figure 12-2. Cross-section of vegetation structure of *Spruce/honeysuckle-reedgrass*— Deep sandy moist soils—Narrow bottoms. Aspects are non-northerly, and gradients average 7%.

Spruce/honeysuckle-reedgrass—Deep sandy moist soils—Narrow bottoms is a moderately common type in narrow draws and canyons, along rocky streams with high gradients. This type occurs along relatively high-gradient streams in areas of hard igneous rock in the northern part of the Gunnison Basin. The type has also been described from southern Colorado and northern New Mexico.

Spruce/honeysuckle-reedgrass—Deep sandy moist soils—Narrow bottoms is characterized by blue spruce (PIPU) or Engelmann spruce (PIEN), bluejoint reedgrass (CACA4), and bush honeysuckle (DIIN5). Aspen (POTR5) and thinleaf alder (ALINT) are conspicuous in some stands. See Table 12-11 for common species names and codes. Location in narrow U-shaped or V-shaped valleys is also a distinguishing feature.

Spruce/honeysuckle-reedgrass—Deep sandy moist soils—Narrow bottoms typically occurs as a narrow strip of forest 5-10 meters wide on either side of streams with enough rocks and high enough gradient to cause 10-30% whitewater. The edges of such stands usually border the base of steep draw slopes or canyon walls. Stands are tall, nearly closed canopies of mixed spruce, sometimes mixed with subalpine fir (ABBI2), aspen (POTR5), or lodgepole pine (PICO). Some alder might grow beside the stream, and the medium to short shrub honeysuckle is scattered through the stand. The understory is patchy, with moderately dense grasses such as bluejoint reedgrass or water sedge (CAAQ) occurring in the wetter spots.

Spruce/honeysuckle-reedgrass—Deep sandy moist soils—Narrow bottoms is related to Spruce-cottonwood—Sandy wet soils—Terraces, which occurs at lower elevations on less steep gradients, and includes narrowleaf cottonwood (POAN3).

Spruce/honeysuckle-reedgrass—Deep sandy moist soils—Narrow bottoms is also related to Spruce/red-osier—Moist soils—Bottoms, which occurs at somewhat lower elevations on steeper gradients, and includes red-osier dogwood (SWSE).

The plant association *Picea pungens/Distegia involucrata* phase *Picea engelmannii* is described as new here, based on *Picea engelmannii/Heracleum sphondylium* (De Velice 1985). *Picea pungens/Distegia involucrata* phase *Alnus incana* ssp. *tenuifolia* is described as new here

Because these stands are dark, rocky, and hard to navigate, and produce little palatable forage, they are not much used by cattle. The water source provides some attraction, but cattle usually seek easier access to water than these stands provide, and the canyon locations provide too little forage and too many hazards for cattle. Tall willow (blue, serviceberry) communities occur adjacent to this type on depositional stream segments with lower gradients. Spruce-fir or cold Douglas-fir forests adjoin this type on steep northerly slopes. Rockslides and outcrops often border these stands.

Horizontal obstruction varies from moderate to very high, averaging around moderately high. Deer make considerable use of these stands for cover or water, although there is little browse for them. Elk use the stands occasionally for summer range. All stands are well outside of these animals' winter ranges. Deer use of all of these communities is very low in the winter; moderate for water and cover in spring through fall (for community types A, C, D), and moderately low for community type B. Elk use is very low in the winter for all communities, but moderate for water and cover (A, C, D), and moderately low in community type B.

Summary of Ecological Characteristics

1. Explanation of symbols in Appendix A. Percentages in [brackets] indicate the percentage of plots sampled that have that characteristic.

Number of Samples	15, soil descriptions from 5 of these (total 15)
ELEVATION	9,696 ft (8,960-10,475 ft); 2,955 m (2,731-3,193 m)
AVERAGE ASPECT	165°M (r = 0.31)
LITHOLOGY	Igneous, granite, tuff, rhyolite, lava, gneiss
FORMATIONS ¹	A variety of igneous
LANDFORMS	Floodplains [60%] and draws [40%]
SLOPE POSITIONS	Bottoms
SLOPE SHAPES	U-shaped [60%] to V-shaped [40%]
SLOPE ANGLE	7.1% (2-14%)
SOIL PARENT MATERIAL	Predominantly alluvium [83%]
COARSE FRAGMENTS	.7% (0-10%) cover on surface, 28.5% (0-45%) by volume in soil
SOIL DEPTH	66 cm (50-82 cm);26.0 in (20-32 in)
Mollic Thickness	6 cm (0-70 cm);14.1 in (0-28 in)
Texture	surfaces are sandy, with sandy loam and loamy sand leading; subsurfaces are sandy or loamy
SOIL CLASSIFICATION	Cryaquolls-Cryaquents [60%] or Cryoborolls [40%]
TOTAL LIVE COVER	371.8% (197.2-635.5%)
Number of Species	24.1 (12-48)
TOTAL LIVE COVER/NO. SPECIES	18.6% (4.1-33.4%)
CLIMATE	Cool, moist to wet forest
WATER	These soils are sandy, rocky, and very permeable, and the stream gradients are high enough such that most
	of the water is in the stream, and never ponds



A spruce/honeysuckle-reedgrass stand (Community Type B). Engelmann spruce 66% cover, serviceberry willow 19%, blue willow 16%, honeysuckle 2%, various sedge species 35%. Soil sampled as a Argic Pachic Cryoboroll, Loamy-Skeletal over Clayey-Skeletal. Italian Creek Quadrangle, elevation 10,280 ft, 14% SSW-facing slope. August 14, 1990.

Community Type Descriptions

- A Blue spruce-alder-reedgrass-water sedge-horsetail Blue spruce is dominant, usually without any other trees. Alder is conspicuous, >25% cover. The understory is dominated by bluejoint reedgrass, >25% cover, and water sedge, >12% cover.
- **B** Engelmann spruce-honeysuckle-reedgrass has abundant Engelmann spruce, >35% cover, dominant or codominant with aspen or subalpine fir (ABBI2). Total graminoid cover is >40%, with bluejoint reedgrass and various sedge species prominent.
- C Engelmann spruce-honeysuckle has abundant Engelmann spruce at >35% cover, dominant or codominant with aspen. Total graminoid cover is <40%.
- **D** *Aspen-reedgrass* Aspen is dominant with >10% cover, often >40%. Spruces are absent to <1%; lodgepole pine is conspicuous in some stands. Bluejoint reedgrass is always present at >10% cover, often >20% cover.

Table	12-9	9. Community types v	vithin Spruce/ho	neysuckle-re	edgr	ass–Deep sai	ndy m	oist soils–Na	arrow bottoms.	
Community Type	No. samples	Elevation, ft Slope, %	Coarseness, % Depth, cm Mollic Depth, cm	Surface Coarse, % Bare, % Seral Stage	Lr	Layer Height, m	Avg Layr	Cover, %: Trees Shrubs Graminoids	No. Species Total Live Cover, % TLC/NS, %	Obstruction %: 1.5-2.0 m 1.0-1.5 m 0.5-1.0 m 0.0-0.5 m Total<2m
A. Blue spruce-alder- reedgrass-water sedge- horsetail	2	9,080 (8,980-9,180) 4.5 (2-7)	23 (0-45) 65 (60-70) 39 (8-70)	* * PN	T1 S1 T2 S2 S3 GF	18 (5-29) 9 (7-10) Missing 4.5 (1.0-7) 1.0 (0.2-1.8) 0.9 (0.0-1.4) 0.0	48 16 M 17 19 93 16	48 (46-49) 49 (30-68) 99 (80-118) 61 (56-66)	25 (18-31) 278 (214-342) 11.5 (11.0-11.9)	*
B. Engelmann spruce- honeysuckle-reedgrass	3	10,280 (10,280- 10,280) 14.0 (14-14)	37 70 70	4 * LS	T1 S1 T2 S2 S3 GF	26 (5-32) Missing Missing 3.5 (2.5-5.0) 0.8 (0.3-2.0) 0.4 (0.1-1.0) 0.0	65 M 35 11 72 15	104 (66-130) 63 (45-90) 58 (41-90) 63 (43-76)	28 (16-48) 289 (197-367) 14.3 (4.1-22.9)	*
C. Engelmann spruce- honeysuckle	3	9,652 (8,960-10,075) 5.0 (4-6)	31 (23-38) 74 (65-82) 34 (11-56)	6 (3-10) * LM	T1 S1 T2 S2 S3 GF M	16 * * * * * *	78 T 10 68 10 52 9	112 (43-200) 59 (11-110) 22 (5-32) 32 (7-52)	31 (12-40) 225 (217-236) 10.0 (5.4-18.5)	80 (60-100) 70 (40-100) 83 (65-100) 75 (50-100) 77 (54-100)
D. Aspen-reedgrass	7	10,475 (10,475- 10,475) 9.5 (9-9)	28 50 0	* * MS	T1 S1 T2 S2 S3 GF M	20 Missing 3.0 (2.0-4.0) Missing 0.5 (0.0-0.4) 0.4 (0.0-0.7) Missing	89 M 29 M 3 100 M	68 (10-110) 74 (1-146) 162 (60-235) 172 (50-265)	20 (12-28) 497 (306-636) 26.2 (16.1-33.4)	60 70 65 100 74

^{*.} Unknown: measurements were not taken in this CT.

Table 12-10. Resource Values for *Spruce/honeysuckle-reedgrass–Deep sandy moist soils–Narrow bottoms*. Resource values were calculated from the numbers in Table 12-9, relative to the whole UGB.

The numbers in this table can be translated: 0 = Very Low, 1 = Low, 2 = Moderately Low, 3 = Moderate, 4 = Moderately High, 5 = High, and 6 = Very High.

		Community Type							
Resource Value	Α	В	C	D					
Potential Cattle Forage Production	2-3	2-3	1-2	2-3					
Grazing Suitability	0-1	0-1	0-1	0-1					
Wetland	No	No	No	No					
Riparian Area	Yes	Yes	Yes	Yes					
Potential Timber Production	3-4 PIPU	5-6 PIEN, POTR5	4-5 PIEN, POTR5, PICO	5-6 POTR5					
Timber Suitability	ns¹	ns¹	ns¹	ns¹					
Developed Recreation	0-1	0-1	0-1	0-1					
Dispersed Recreation	2-3	2-3	2-3	1-2					
Scenic	4-5	4-5	5-6	5-6					
Road & Trail Stability	3-4	3-4	3-4	2-3					
Construction Suitability	0-1	0-1	0-1	0-1					
Deer & Elk Hiding Cover	5-6	3-4	4-6	6					
Deer & Elk Forage & Browse	2	2	3	3-4					
Need for Watershed Protection	2-3	2-3	2-3	3-4					
Soil Stability	3-4	3-4	3-4	3					
Risk of Soil Loss-Natural	2-3	2-3	2-3	3					
Risk of Soil Loss-Management	3	3	3	3-4					
Risk of Permanent Depletion-Range	1	1	1	2					
Risk of Permanent Depletion-Wildlife	2	2-3	2-3	3-4					
Risk of Permanent Depletion-Timber	ns¹	ns¹	ns¹	ns¹					
Resource Cost of Management	3	3	3	3-4					

^{1.} Not suitable because riparian area.

Table 12-11. Common Species in *Spruce/honeysuckle-reedgrass–Deep sandy moist soils–Narrow bottoms*, where Characteristic cover > 10% or Constancy > 20%. "–" means that the species is not found. Dead cover is not listed. Ccv = Characteristic Cover, Con = Constancy. If Avc = Average Cover, then these are related using the formula Avc = Ccv•100%/Con.

	, worago cover,	anon anoco ano	rolated deling the	1011114147110	001 10070700	1111
		СО	M M U N I	TYT	Y P E	
		Α	В	С	D	
		Ccv (Con)	Ccv (Con)	Ccv (Con)	Ccv (Con)	
Code	Species	N = 2	3	3	7	Common Name
	TREES					
ABBI2	Abies bifolia		30 (67)	T (33)	T (14)	subalpine fir
PIEN	Picea engelmannii		54 (100)	66 (100)	1 (43)	Engelmann spruce
PIPU	Picea pungens	48 (100)	- ` <u>-</u>	- ` <u>-</u>	1 (29)	blue spruce
PICO	Pinus contorta	- ` <u>-</u>	6 (67)	22 (33)	15 (29)	lodgepole pine
POTR5	Populus tremuloides		27 (100)	58 (67)	64 (100)	quaking aspen
	SHRUBS					<u> </u>
ALINT	Alnus incana ssp. tenuifolia	30 (100)	40 (33)	70 (33)	64 (71)	thinleaf alder
ARCA13	Artemisia cana	- ` <u>-</u>	- ` -	- ` <u>´</u>	20 (14)	silver sagebrush
DIIN5	Distegia involucrata	T (50)	9 (100)	10 (100)	4 (57)	bush honeysuckle
JUCO6	Juniperus communis	- ` ´	7 (67)	6 (33)	5 (43)	common juniper
PEFL15	Pentaphylloides floribunda	6 (100)	- ` ´	4 (33)	8 (29)	shrubby cinquefoil
RIIN2	Ribes inerme	10 (50)	T (33)	1 (33)	5 (14)	whitestem currant
RILA	Ribes lacustre	- ` <u>-</u>	- ` -	23 (33)	- ` -	swamp black gooseberry
ROWO	Rosa woodsii	7 (100)	10 (33)	7 (67)	11 (29)	Woods rose
SALU2	Salix lutea	- ` <i>-</i>	- ` ´	- ` ´	50 (14)	yellow willow
SAMO2	Salix monticola	3 (50)	19 (33)	2 (33)	- ` ´	serviceberry willow
SAPL2	Salix planifolia	- ` <u>´</u>	- ` ´	- ` ´	30 (14)	planeleaf willow
SYRO	Symphoricarpos rotundifolius				20 (14)	mountain snowberry
VAMYO	Vaccinium myrtillus ssp. oreophilum		33 (67)	5 (33)	- ` -	Rocky Mtn. whortleberry

Table 12-11. (Continued)

		СО	M M U N	I T Y T	Y P E	
		A Ccv (Con)	B Ccv (Con)	C Ccv (Con)	D Ccv (Con)	
Code	Species	N = 2	3	3	7	Common Name
	GRAMINOIDS					_
ALPR3	Alopecurus pratensis				10 (14)	meadow foxtail
BRCA10	Bromopsis canadensis		1 (33)	4 (33)	32 (71)	fringed brome
BRPO5	Bromopsis porteri	1 (50)	T (33)	4 (33)		nodding brome
CACA4	Calamagrostis canadensis	46 (100)	20 (100)	10 (67)	43 (100)	bluejoint reedgrass
CAREX CAAQ	Carex Carex aquatilis	28 (50) 24 (100)	6 (33) 3 (33)	12 (33)	30 (14)	sedge water sedge
CAAQ CAGE2	Carex aquatilis Carex geyeri	24 (100)	35 (67)	12 (33) 14 (67)	64 (43)	elk sedge
CAPA14	Carex pachystachya		30 (33)			Chamisso sedge
CAUT	Carex utriculata				40 (14)	beaked sedge
ELEL5	Elymus elymoides				15 (14)	bottlebrush squirreltail
ELGL	Elymus glaucus				35 (14)	blue wildrye
ELRE3	Elytrigia repens	6 (100)			30 (29)	creeping quackgrass
JUARA4	Juncus arcticus ssp. ater	17 (50)				Baltic rush
POPR	Poa pratensis			2 (33)	70 (57)	Kentucky bluegrass
-	FORBS					
ACLA5	Achillea lanulosa	6 (100)	1 (33)	2 (67)	35 (29)	western yarrow
ACCO4	Aconitum columbianum		3 (33)	5 (33)	9 (43)	Columbian monkshood
ANPI2 ARAN7	Angelica pinnata Argentina anserina	11 (50)			10 (14)	small-leaf angelica silverweed
ARCO9	Argentina ansenna Arnica cordifolia	11 (50)	53 (67)	4 (33)	20 (14)	heartleaf arnica
ASTER	Aster			4 (33)	10 (14)	aster
CACO6	Cardamine cordifolia		5 (33)	T (33)	30 (14)	heartleaf bittercress
CHDA2	Chamerion danielsii	5 (50)	2 (100)	5 (33)	48 (14)	fireweed
FRVI	Fragaria virginiana	2 (50)	1 `(33)	T (100)	38 (43)	Virginia strawberry
GERI	Geranium richardsonii	1 (50)	4 (33)	9 (67)	39 (43)	Richardson geranium
HESP6	Heracleum sphondylium		20 (33)	3 (33)	26 (57)	cow-parsnip
LALE2	Lathyrus leucanthus				44 (29)	aspen peavine
LUAR3 MAST4	Lupinus argenteus Maianthemum stellatum	54 (50)	3 (33)	1 (33)	9 (43)	silvery lupine star Solomon-plume
MECI3	Mertensia ciliata	34 (30)	6 (67)	1 (100)	13 (29)	mountain bluebells
MIGU	Mimulus guttatus				18 (29)	common monkey flower
ORPA3	Oreochrysum parryi			18 (33)		Parry goldenweed
OSCH	Osmorhiza chilensis	21 (50)	1 (33)			sweet cicely
OSDE	Osmorhiza depauperata	- ` -	- ` -		30 (14)	sweet cicely
OXFE	Oxypolis fendleri		5 (67)	T (33)	22 (43)	Fendler cowbane
PSMO	Pseudocymopterus montanus		1 (33)	T (33)	1 (14)	mountain parsely
SESE2	Senecio serra				10 (14)	butterweed groundsel
SETR STFA3	Senecio triangularis Streptopus fassettii		5 (33) 5 (33)		23 (43) 13 (29)	arrowleaf groundsel clasp-leaf twisted-stalk
TAOF	Taraxacum officinale		3 (33)	2 (33)	28 (57)	common dandelion
THFE	Thalictrum fendleri		1 (33)	2 (33)	27 (29)	Fendler meadow-rue
THSP	Thalictrum sparsiflorum	15 (50)				few-flowered meadow-rue
VAED	Valeriana edulis				17 (14)	edible valerian
VIAM	Vicia americana			6 (33)	39 (29)	American vetch
VIOLA	Viola	1 (50)	2 (33)	2 (33)		violet
	FERNS & FERN-ALLIES					
EQAR	Equisetum arvense	21 (100)		T (33)	47 (43)	field horsetail
	GROUND COVER					
.BARESO	bare soil					
.LITTER	litter and duff	100 (100)	83 (33)	83 (67)	100 (14)	
GRAVEL	gravel 0.2-10 cm	-	- (00)	- (22)	-	
.COBBLE	cobble 10-25 cm		1 (33)	3 (33)		
.STONES	stone > 25 cm moss on soil	32 (50)	2 (33)	5 (67)		
.MOSSON LICHENS	lichens on soil	33 (50)	15 (33) –	9 (33) 1		
LIOTILINO	IIOIIOIIO OII OOII			1		

Table 12-8. Wildlife values (relative to the whole UGB) for the principal wildlife species using								
Spruce/honeysuckle-reedgrass–Deep sandy moist soils–Narrow bottoms.								
	Mule Deer Elk							
CT	Season-Preference	Season-Preference						
A, C, D	Winter, Any- Very Low	Winter, Any- Very Low						
A, C, D	Spring/Fall– Moderate (Water, Cover)	Spring/Fall- Moderate (Water, Cover)						
В	Winter, Any- Very Low	Winter, Any- Very Low						
D	Spring/Fall- Mod. Low (Water, Cover)	Spring/Fall- Mod. Low (Water, Cover)						

SPRUCE/RED-OSIER-MOIST SOILS-BOTTOMS

Spruce/red-osier–Cryaquolls and Cryaquents– V-shaped, narrow alluvial watercourses, 8,500-9,200 ft

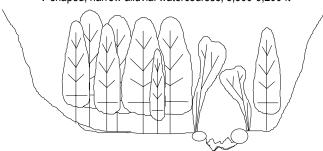


Figure 12-3. Cross-section of vegetation structure of *Spruce/red-osier–Moist soils–Bottoms*.

Aspects are non-northerly, and gradients average 11%

Spruce/red-osier—Moist soils—Bottoms is an uncommon type in narrow, V-shaped canyons, on cold (Cryic) soils. This type occurs in steep, V-shaped canyons and draws in the northern part of the Gunnison Basin. It has also been described from eastern Idaho, and likely occurs in other locations as well. Spruce/red-osier—Moist soils—Bottoms is characterized by blue spruce (PIPU) or Engelmann spruce (PIEN), and red-osier dogwood (SWSE). See Table 12-15 for common species names and codes.

Spruce/red-osier—Moist soils—Bottoms is typically a medium to tall stand of Engelmann or blue spruce, sometimes codominant with subalpine fir (ABBI2). The understory is dominated by red-osier dogwood, a medium to tall shrub. Spruce/red-osier—Moist soils—Bottoms is related to Spruce/honeysuckle-reedgrass—Deep sandy moist soils—Narrow bottoms, which occurs at higher elevations on less steep gradients and on sandy soils, and generally lacks red-osier.

The two community types actually represent two different plant associations, one dominated by spruce, and another which lacks trees and is dominated by red-osier. They are included in the same Ecological Type because the landforms and soils on which they occur are very similar, and the vegetation is similar except for the trees.

The plant association *Picea pungens-Picea engelmannii/ Swida sericea* has been described by Youngblood (1985) and Hess (1982). *Picea pungens-Picea engelmannii/Swida sericea* phase *Picea engelmannii* is described as new here. *Swida sericea/Ribes inerme* (Johnston 1987), is similar in part to *Cornus stolonifera/Heracleum lanatum* (Youngblood 1985). Tall willow (blue, serviceberry) communities occur on adjacent depositional stream segments with less steep gradients. Spruce-fir or cold Douglas-fir forests adjoin this type on steep northerly slopes. Rockslides and outcrops frequently border this type.

These stands are not much used by cattle because there is little palatable forage and the stands are rocky and hard to navigate. The water source provides some attraction, but cattle prefer easier access to water. The canyon locations have too little forage and too many hazards for cattle. Horizontal obstruction has not yet been measured in this Ecological Type, though it is likely to be moderately high to high. Deer and elk use these stands for water and some thermal cover. In general, the sites are outside deer and elk winter ranges. Elk and deer use of both community types is moderate during spring through fall for water and browse.

	Table 12-12. Wildlife values (relative to the whole UGB) for the principal wildlife species using Spruce/red-osier–Moist soils–Bottoms.						
Ī		Mule Deer	Elk				
	CT	Season-Preference	Season-Preference				
Ī	All	Winter, Any- Low	Winter, Any- Low				
	All	Spring/Fall- Moderate (Water, Browse)	Spring/Fall– Moderate (Water, Browse)				

Summary of Ecological Type Characteristics
1. Explanation of symbols in Appendix A. Percentages in [brackets] indicate the percentage of plots sampled that have that characteristic.

NUMBER OF SAMPLES	7, soil descriptions from 1 of these (total 7)
ELEVATION	8,854 ft (8,560-9,180 ft); 2,699 m (2,609-2,798 m)
AVERAGE ASPECT	192°M (r = 0.76)
LITHOLOGY	Granite [78%] and mixed [22%]
FORMATIONS ¹	Xg [71%] and mixed [29%]
LANDFORMS	Gorges, terraces, floodplains
SLOPE POSITIONS	Bottoms
SLOPE SHAPES	V-shaped [75%]
SLOPE ANGLE	10.7% (3-36%)
SOIL PARENT MATERIAL	Alluvium [55%] or colluvium [45%]
COARSE FRAGMENTS	24.2% (2-95%) cover on surface, 0.0% (52-52%) by volume in soil
SOIL DEPTH	50 cm; 20 in
MOLLIC THICKNESS	6 cm; 2 in
Texture	Silt loam surface and subsurface
SOIL CLASSIFICATION	Cryaquolls [63%] or Cryaquents [25%]
Total Live Cover	172.7% (76.4-279.5%)
Number of Species	24.0 (17-31)
Total Live Cover/No. Species	7.4% (3.5-10.8%)
CLIMATE	Cool to cold, moist, highly shaded forest.
WATER	These soils are rocky and very permeable, and the stream gradients are high enough that most of the water
	is in the stream, and never ponds.



A general view of a spruce/red-osier stand along Spring Creek. September 3, 1987.



Within a dense spruce/red-osier stand (Community Type A).
Engelmann spruce 71% cover, subalpine fir 22%, red-osier dogwood 53%, honeysuckle 6%, horsetail 19%. Soil sampled as a Typic Cryaquent, Fine-Loamy. Cement Mountain Quadrangle, elevation 8,670 ft, 4.8% SSW-facing streamside. September 11, 1990.

Key to Community Types

Description of Community Types

- A *Spruce-red-osier* is dominated by blue or Engelmann spruce which is sometimes codominant with subalpine fir. The understory is dominated by red-osier dogwood at >20% cover, often >50% cover. Field horsetail (EQAR) is prominent, with >15% cover. Bluejoint reedgrass is sometimes prominent at >35% cover. Bush honeysuckle (DIIN5) is constant.
- **B** *Red-osier* is dominated by red-osier with >40% cover. Trees are absent to minor, usually with <1% cover. Field horsetail is absent to <5% cover. Bluejoint reedgrass is never prominent. Whitestem currant (RIIN2) is constant.

Communities Not Assigned to a Community Type

A community dominated by raspberry (RUID) and rose, with elk sedge and Kentucky bluegrass prominent.
 Spruce and fir were formerly dominant in this bottom, but the trees are knocked down almost every year by snowslides.

	Table 12-13. Community types within Spruce/red-osier–Moist soils–Bottoms.										
Community Type	No. samples	Elevation, ft Slope, %	Coarseness, % Depth, cm Mollic Depth, cm	Surface Coarse, % Bare, % Seral Stage	Lr	Layer Height, m	Avg Layr Cvr %	Cover, %: Trees Shrubs Graminoids Forbs	No. Species Total Live Cover, % TLC/NS, %	Obstruction %: 1.5-2.0 m 1.0-1.5 m 0.5-1.0 m 0.0-0.5 m Total<2m	
A. Spruce-red-osier	3	8,925 (8,670-9,180) 4.3 (3-5)	52 50 6	16 (2-37) 14 (2-25) LS	T1 T2 S1 S2 GF M	29 (5-33) 3.3 (0.5-6) 2.3 (1.8-3.5) 0.6 (0.1-2.0) 0.3 (0.0-1.0) 0.0	41 28 27 57 54 12	83 (61-109) 77 (35-129) 37 (3-63) 12 (4-23)	25 (24-26) 238 (202-279) 9.6 (8.4-10.7)	*	
B. Red-osier	3	8,698 (8,560-8,925) 19.7 (9-36)	* * *	33 (2-95) 9 (2-20) MS		*		0 (0-0) 109 (64-153) 4 (3-5) 10 (7-15)	21 (17-24) 125 (76-166) 6.3 (3.5-9.8)	*	

^{*.} Unknown: measurements were not taken in this CT.

Table 12-14. Resource Values for Spruce/red-osier–Moist soils–Bottoms. Resource values were calculated from the numbers in Table 12-13, relative to the whole UGB.									
The numbers in this table can be translated: 0 = Very Low, 1 = Low, 2 = Moderately Low, 3 = Moderate, 4 = Moderately High, 5 =									
High, and 6 = Very High.									
	Commun	ity Type		Commun	ity Type				
Resource Value	Α	В	Resource Value	Α	В				
Potential Cattle Forage Production	1-2	0-1	Deer & Elk Hiding Cover	4-5	4-5				
Grazing Suitability	ns¹	ns¹	Deer & Elk Forage & Browse	1-2	2-3				
Wetland	No	No	Need for Watershed Protection	3	3				
Riparian Area	Yes	Yes	Soil Stability	2-3	2-3				
Potential Timber Production	3-4	0	Risk of Soil Loss-Natural	3-4	3-4				
Timber Suitability	ns¹	ns¹	Risk of Soil Loss-Management	2	2				
Developed Recreation	2-3	2-3	Risk of Permanent Depletion-Range	ns¹	ns¹				
Dispersed Recreation	3-4	3-4	Risk of Permanent Depletion-Wildlife	2	2-3				
Scenic	3-4	3-4	Risk of Permanent Depletion-Timber	ns¹	ns¹				
Road & Trail Stability	2-3	2-3	Resource Cost of Management	4	4				
Construction Suitability	2	2	Cost of Rehabilitation	1-2	1-2				

1. Not suitable, because riparian area.

Table 12-15. Common Species in *Spruce/red-osier–Moist soils–Bottoms*, where Characteristic cover > 10% or Constancy > 20%. "–" means that the species is not found. Dead cover is not listed. Ccv = Characteristic Cover, Con = Constancy. If Avc = Average Cover, then these are related using the formula Avc = Ccv•100%/Con.

		COMM A	UNITY TYPE B	
		Ccv (Con)	Ccv (Con)	
Code	Species	N = 3	3	Common Name
0000	TREES	., ,		Common Hamo
ABBI2	Abies bifolia	26 (67)		subalpine fir
PIEN	Picea engelmannii	74 (67)		Engelmann spruce
PIPU	Picea pungens	47 (33)	T (33)	blue spruce
	SHRUBS	,	,	
ALINT	Alnus incana ssp. tenuifolia		60 (33)	thinleaf alder
DIIN5	Distegia involucrata	8 (100)	10 (33)	bush honeysuckle
RIIN2	Ribes inerme	1 (67)	4 (100)	whitestem currant
ROWO	Rosa woodsii	9 (100)	4 (67)	Woods rose
RUID	Rubus idaeus	6 (33)	4 (33)	American red raspberry
SADR	Salix drummondiana	4 (100)	8 (33)	blue willow
SAMI15	Sambucus microbotrys	T (33)	3 (33)	mountain red elderberry
SWSE	Swida sericea	51 (100)	72 (100)	red-osier
	GRAMINOIDS			
CACA4	Calamagrostis canadensis	47 (67)	2 (67)	bluejoint reedgrass
PONEI2	Poa nemoralis ssp. interior	4 (33)	3 (33)	interior bluegrass
	FORBS			
ASLAH2	Aster lanceolatus ssp. hesperius	T (33)	1 (33)	Siskiyou aster
CHDA2	Chamerion danielsii	3 (67)	1 (67)	fireweed
FRVI	Fragaria virginiana	2 (67)	T (33)	Virginia strawberry
GATR2	Galium trifidum	T (33)	T (33)	small bedstraw
GECA3	Geranium caespitosum	1 (33)	T (33)	Fremont geranium
GERI	Geranium richardsonii	2 (33)	2 (33)	Richardson geranium
HESP6	Heracleum sphondylium	2 (100)	2 (67)	cow-parsnip
MAST4	Maianthemum stellatum	4 (33)	T (33)	star Solomon-plume
OSDE	Osmorhiza depauperata	1 (33)	1 (33)	sweet cicely
PYROA3	Pyrola rotundifolia ssp. asarifolia	T (33)	2 (33)	swamp wintergreen
THFE	Thalictrum fendleri	T (33)	1 (33)	Fendler meadow-rue
	FERNS & FERN-ALLIES			
EQAR	Equisetum arvense	28 (100)	2 (33)	field horsetail
	GROUND COVER			
.BARESO	bare soil	14 (67)	9 (100)	
.LITTER	litter and duff	75 (100)	57 (100)	
GRAVEL	gravel 0.2-10 cm	2	-	
.COBBLE	cobble 10-25 cm	35 (33)		
.STONES	stone > 25 cm	7 (33)		
.MOSSON	moss on soil	23 (67)		
LICHENS	lichens on soil	9	23	

FR6 ABBI2-PIEN/SETR-MECI3-CACO6

FIR-SPRUCE/WET FORBS-MOIST SOILS-NARROW V-SHAPED BOTTOMS

Subalpine fir-Engelmann spruce/Arrowleaf groundsel-bluebells-bittercress— Moderately deep to deep Cryaquolls–V-shaped, narrow ravines and draw bottoms, >9,500 ft

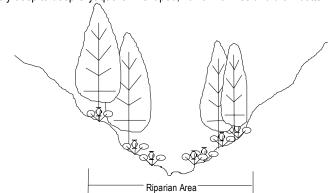


Figure 12-4. Cross-section of vegetation structure of Fir-spruce/wet forbs—Moist soils— Narrow V-shaped bottoms. The tallest shrub layer typically averages 1.6 ft tall. Aspects are non-northerly, and slope angles average 12%.

Fir-spruce/wet forbs—Moist soils—Narrow V-shaped bottoms is a very common type in little narrow ravines and draws, usually occurring as a microsite within a spruce-fir stand of another type. The streams are usually narrow, first-order streams. Representative soil samples are difficult to obtain on such sites because the draws are typically narrow, V-shaped, and steep-sided, so that location of a soil pit is not obvious. In the Gunnison Basin, this type occurs along Subalpine rivulets and draws. It has also been described from throughout the Rocky Mountains, from western Montana through western Wyoming and northern Utah, and throughout the mountains of Colorado.

Fir-spruce/wet forbs—Moist soils—Narrow V-shaped bottoms is characterized by subalpine fir (ABBI2), Engelmann spruce (PIEN), bluejoint reedgrass (CACA4), and wet-site forbs such as arrowleaf groundsel (SETR), mountain bluebells (MECI3), or heartleaf bittercress (CACO6). See Table 12-19 for common species names and codes. Other distinguishing features include location on first-order stream channels, adjacent spruce-fir forest, and Cryaquoll soils.

Fir-spruce/wet forbs—Moist soils—Narrow V-shaped bottoms typically occurs as a dense, closed stand of mixed subalpine fir and Engelmann spruce, sometimes with aspen (POTR5) or Douglas-fir (PSME) sharing dominance. Stands occupy bottoms of V-shaped ravines and extend a few meters up the steep sides. The understory is highly shaded, and varies in species composition, but nearly always includes some wet-site forbs. Arrowleaf groundsel is the most constant of these, but some stands support bluebells, bittercress, cow-parsnip (HESP6), or twisted-stalk (STFA3).

Fir-spruce/wet forbs—Moist soils—Narrow V-shaped bottoms is related to Spruce/red-osier—Moist soils—Bottoms, which occurs at lower elevations in somewhat wider bottoms with perennial, order 2-3 streams, and features prominent red-osier. Fir-spruce/wet forbs—Moist soils—Narrow V-shaped bottoms is also related to Spruce/honeysuckle-reedgrass—Deep sandy moist soils—Narrow bottoms, which occurs at somewhat lower elevations, in wider bottoms with perennial, order 2-3 streams, on sandy soils.

The plant association Abies bifolia-Picea engelmannii/Senecio triangularis-Mertensia ciliata-Cardamine cordifolia is described as new here, based on Picea engelmannii/Senecio triangularis (Hess 1981), Abies lasiocarpa/Streptopus amplexifolius (Henderson 1977), and Abies lasiocarpa/Calamagrostis canadensis (Henderson 1977, Pfister 1977). Abies bifolia-Picea engelmannii/Senecio triangularis-Mertensia ciliata-Cardamine cordifolia phase Pseudotsuga menziesii is described as new here. Spruce-fir forests occur on adjacent uplands.

These sites are too steep, narrow, and devoid of forage to support livestock. Occasionally a livestock trail crosses one of these draws and livestock will water there. Horizontal obstruction is usually high to very high. The stands are used primarily by deer, because they are typically too steep for elk. These sites are never winter range in any year, since they are surrounded by Subalpine forest and accumulate much snow. Community types A and B receive moderate use by mule deer for cover and browse spring through fall; community type B receives moderately low use.

Summary of Ecological Type Characteristics

1. Explanation of symbols in Appendix A. Percentages in [brackets] indicate the percentage of plots sampled that have that characteristic.

NUMBER OF SAMPLES	12, soil descriptions from 3 of these (total 12)
ELEVATION	10,254 ft (9,590-11,640 ft); 3,125 m (2,923-3,548 m)
AVERAGE ASPECT	127°M (r = 0.16)
LITHOLOGY	A variety, including some igneous such as breccia and granite [67%] or sedimentary such as shale and sandstone [33%]
FORMATIONS ¹	Tpl [44%], Xg [22%], Km [22%], Kd
LANDFORMS	Ravines and draws [63%], several others
SLOPE POSITIONS	Bottoms
SLOPE SHAPES	V-shaped or otherwise concave
SLOPE ANGLE	10.7% (2-27%)
SOIL PARENT MATERIAL	Alluvium [46%] or colluvium [46%]
COARSE FRAGMENTS	3.9% (0-10%) cover on surface, 42.9% (29-59%) by volume in soil
SOIL DEPTH	50 cm (20-76 cm); 19.6 in (8-30 in)
MOLLIC THICKNESS	26 cm (0-65 cm; 10.2 in (0-26 in)
Texture	A variety of surface textures; subsurfaces are sandier, such as sandy clay loam or sandy loam
SOIL CLASSIFICATION	Cryaquolls [83%]. mostly moderately deep
TOTAL LIVE COVER	231.3% (113.2-415.5%)
NUMBER OF SPECIES	23.3 (7-37)
TOTAL LIVE COVER/NO. SPECIES	12.6% (5.3-34.7%)
CLIMATE	Cold to moderately cold, moist, highly shaded Subalpine forest.
Water	These soils are rocky and very permeable, and the stream gradients are high enough that most of the water is in the stream, and never ponds. Some of these streams dry up in late season of dry years.

	Table 12-16. Wildlife values (relative to the whole UGB) for the principal wildlife species using Fir-spruce/wet forbs–Moist soils–Narrow V-shaped bottoms. "I" means the same as above.							
ĺ		Mule Deer	Elk					
l	CT	Season-Preference	Season-Preference					
	A, B	Winter, Any- Very Low Spring/Fall- Moderate (Cover, Browse)	Winter, Any- Very Low Spring/Fall- Low					
	С	Winter, Any- Very Low Spring/Fall- Mod. Low (Cover, Browse)	1					

Key to Community Types 1. Dominated by Engelmann spruce (>20% cover) and subalpine fir	
 Dominated by aspen (>50% cover) or Douglas-fir; or trees absent Dominated by Douglas-fir, codominant with subalpine fir, Engelmann spruce, and aspen 	
2. Dominated by aspen, or trees absent	
3. Dominated by aspen, >50% cover. Thinleaf alder prominent, >30% cover. Total shrub cover >80%. Total graminoid cover >80%	В
3. Trees absent. Thinleaf alder and other shrubs absent. Total graminoid cover <95%	<u>C</u>

Description of Community Types

- A Engelmann spruce-subalpine fir-bittercress-arrowleaf groundsel is dominated by Engelmann spruce at >20% cover, often >50%, and subalpine fir, usually at >10% cover. Total graminoid cover is <35%, mostly bluejoint reedgrass. One or more wet-site forb species are prominent.
- **B** Aspen-alder-reedgrass-wet forbs is dominated by aspen, usually alone, but occasionally with small amounts of Douglas-fir or lodgepole pine (PICO); lodgepole pine is apparently fugitive from adjacent spruce-fir stands. Thinleaf alder is prominent at >30% cover. Total shrub cover is >80%. Bluejoint reedgrass is prominent, >20% cover, as are various sedge species at >30% cover. Total graminoid cover is >80%.
- C Wet forbs has no trees or shrubs. Bluejoint reedgrass or wet forbs are dominant. Total graminoid cover is <95%.

Communities Not Assigned to a Community Type

 A community dominated by aspen, with Douglas-fir codominant or subdominant and the understory supports alder, wet forbs, and bluejoint reedgrass, but bush honeysuckle (DIIN5) is also prominent. This plot may be a Douglas-fir phase of this type, which is underrepresented in our sample.

Table 12-17. Com	Table 12-17. Community types within Fir-spruce/wet forbs–Moist soils–Narrow V-shaped bottoms.										
Community Type	No. samples	Elevation, ft Slope, %	Coarseness, % Depth, cm Mollic Depth, cm	Surface Coarse, % Bare, % Seral Stage	Lr	Layer Height,	Avg Layr Cvr %	Cover, %: Trees Shrubs Graminoids Forbs	No. Species Total Live Cover, % TLC/NS, %	Obstruction %: 1.5-2.0 m 1.0-1.5 m 0.5-1.0 m 0.0-0.5 m Total<2m	
A. Engelmann spruce-subalpine fir- bittercress-arrowleaf groundsel	6	9,970 (9,590-10,860) 9.0 (2-18)	43 (29-59) 55 (50-65) 52 (40-65)	4 (1-10) 3 (1-8) LS	T1 T2 T3 S GF M	22 (10-25) 4.8 (1.5-10) 1.3 (0.4-2.5) 0.7 (0.0-3.0) 0.4 (0.0-1.5) 0.0	75.4 19.3 6.4 6.2 67.5 13.2	, ,	31 (25-37) 210 (186-237) 6.9 (5.3-8.2)	58 (40-80) 63 (55-75) 83 (75-95) 97 (90-100) 75 (70-80)	
B. Aspen-alder- reedgrass-wet forbs	3	*	* * *	* * MS		*		68 (56-87) 88 (80-92) 100 (80-130) 122 (100-150)	16 (11-23) 389 (369-416) 26.8 (16.0-34.7)	*	
C. Wet forbs	3	10,823 (10,100- 11,640) 14.2 (3-27)	* 44 (20-76) 0 (0-0)	4 (1-10) 4 (2-5) EM		*		0 (0-0) 0 (0-0) 34 (0-90) 82 (23-117)	15 (7-21) 116 (113-119) 9.8 (5.6-16.7)	*	

^{*.} Unknown: measurements were not taken in this CT.

Table 12-18. Resource Values for *Fir-spruce/wet forbs–Moist soils–Narrow V-shaped bottoms*. Resource values were calculated from the numbers in Table 12-17, relative to the whole UGB.

The numbers in this table can be translated: 0 = Very Low, 1 = Low, 2 = Moderately Low, 3 = Moderate, 4 = Moderately High, 5 = High, and 6 = Very High.

	Community Type				
Resource Value	Α	В	С		
Potential Cattle Forage Production	1-2	3-4	1-2		
Grazing Suitability	ns¹	ns¹	ns¹		
Wetland	No	No	No		
Riparian Area	Yes	Yes	Yes		
Potential Timber Production	4-5	3-4	0		
Timber Suitability	ns¹	ns¹	ns¹		
Developed Recreation	ns¹	ns¹	ns¹		
Dispersed Recreation	ns¹	ns¹	ns¹		
Scenic	0-1	0-1	0-1		
Road & Trail Stability	0-1	0-1	0		
Construction Suitability	0	0	0		
Deer & Elk Hiding Cover	6	6	3-4		
Deer & Elk Forage & Browse	1-2	4-5	1-2		
Need for Watershed Protection	5-6	5-6	5-6		
Soil Stability	0-1	0-1	0-1		
Risk of Soil Loss-Natural	4-5	4-5	4-5		
Risk of Soil Loss-Management	5-6	5-6	5-6		
Risk of Permanent Depletion-Range	ns¹	ns¹	ns¹		
Risk of Permanent Depletion-Wildlife	4-5	4-5	4-5		
Risk of Permanent Depletion-Timber	ns¹	ns¹	ns¹		
Resource Cost of Management	5-6	5-6	5-6		
Cost of Rehabilitation	5	5	5		

1. Not suitable because riparian area.



A typical view inside a fir-spruce riparian area (Community Type A). Engelmann spruce 83% cover, subalpine fir 59%, honeysuckle 5%, cow-parsnip 8%, heartleaf arnica 8%, bluebells 4%. Soil sampled as a Histic (or Typic) Cryaquent, Loamy-Skeletal, Mixed. West Elk Peak SW Quadrangle, elevation 9,700 ft, 7% 126° (ESE) draw. October 11, 1994.



A typical view from outside a fir-spruce riparian area (Community Type A). Engelmann spruce 65% cover, subalpine fir 4%, bluejoint reedgrass 13%, arrowleaf groundsel 44%, miterwort 30%, bittercress 25%. Soil sampled as a Histic Cryaquoll, Sandy-Skeletal. Garfield Quadrangle, elevation 10,860 ft, 11% 254° (WSW) draw. August 26, 1994.

Table 12-19. Common Species in *Fir-spruce/wet forbs–Moist soils–Narrow V-shaped bottoms*, where Characteristic cover > 10% or Constancy > 20%. "–" means that the species is not found. Dead cover is not listed. Ccv = Characteristic Cover, Con = Constancy. If Avc = Average Cover, then these are related using the formula Avc = Ccv•100%/Con.

	COMMUNITY TYPE				
		A Ccv(Con)	B Ccv(Con)	C Ccv(Con)	
Code	Species	N = 6	3	3	Common Name
	TREES				
ABBI2	Abies bifolia	28(100)			subalpine fir
PIEN	Picea engelmannii	56(100)			Engelmann spruce
POTR5	Populus tremuloides	20 (17)	65(100)		quaking aspen
PSME	Pseudotsuga menziesii	55 (17)	7 (33)		Douglas-fir
	SHRUBS				
ALINT	Alnus incana ssp. tenuifolia	22 (17)	67(100)		thinleaf alder
DIIN5	Distegia involucrata	2 (67)	1 (33)		bush honeysuckle
JUCO6	Juniperus communis		20 (33)		common juniper
RIIN2	Ribes inerme		15 (33)		whitestem currant
SYRO VAMYO	Symphoricarpos rotundifolius	1 (50)	20 (33)		mountain snowberry
VAIVITO	Vaccinium myrtillus ssp. oreophilum	1 (50)			Rocky Mountain whortleberry
DDOMA	GRAMINOIDS	T (47)	00 (22)		C11
BRCA10	Bromopsis canadensis	T (17)	20 (33)		fringed brome
CACA4 CAREX	Calamagrostis canadensis	10 (83)	40(100)	90 (33)	bluejoint reedgrass
CAREX CAGE2	Carex	4 (22)	43 (67) 30 (33)		sedge elk sedge
ELGL	Carex geyeri Elymus glaucus	4 (33)	15 (33)		blue wildrye
LUPA4	Luzula parviflora	1 (50)		T (33)	millet woodrush
POPR	Poa pratensis		25 (33)		Kentucky bluegrass
	FORBS		20 (00)		. tomasty stategrate
ACLA5	Achillea lanulosa		20 (33)	T (33)	western yarrow
ACCO4	Aconitum columbianum	3 (17)	30 (33)	T (33)	Columbian monkshood
ARCO9	Arnica cordifolia	4 (50)			heartleaf arnica
CACO6	Cardamine cordifolia	12(100)	35 (33)	18 (33)	heartleaf bittercress
COSC2	Conioselinum scopulorum	12 (33)			Rocky Mountain hemlock-parsley
GERI	Geranium richardsonii	1 (17)	35 (33)		Richardson geranium
GEMA4	Geum macrophyllum	1 (50)			large-leaved avens
HESP6	Heracleum sphondylium	1 (33)	35 (67)		cow-parsnip
LIPO	Ligusticum porteri	11 (17)			osha
MECI3	Mertensia ciliata	5 (83)	18 (67)	50 (67)	mountain bluebells
MIPE	Mitella pentandra	2 (50)			five-stamen miterwort
MIST3	Mitella stauropetala	10 (50)			side-petaled miterwort
OSCH	Osmorhiza chilensis	3 (50)			sweet cicely
OXFE PSMO	Oxypolis fendleri Pseudocymopterus montanus	8 (67)	10 (33)		Fendler cowbane mountain parsely
SETR	Senecio triangularis	15 (17) 10(100)	35 (67)	55 (67)	arrowleaf groundsel
STELL	Stellaria	17 (17)			chickweed
STFA3	Streptopus fassettii	21 (67)	15 (33)		clasp-leaf twisted-stalk
TAOF	Taraxacum officinale		20 (33)	T (33)	common dandelion
THFE	Thalictrum fendleri		15 (33)		Fendler meadow-rue
VEAM2	Veronica americana	9 (67)	_ ` _		American brooklime
	FERNS & FERN-ALLIES				
EQAR	Equisetum arvense	26 (33)	35 (33)		field horsetail
	GROUND COVER				
.BARESO	bare soil	3 (83)		4(100)	_
LITTER.	litter and duff	80(100)		92(100)	
GRAVEL	gravel 0.2-10 cm	T	_		
.COBBLE	cobble 10-25 cm	2 (67)			
.STONES	stone > 25 cm	3 (50)			
.MOSSON	moss on soil	17 (67)			
LICHENS	lichens on soil	19	-	3	